10/538541
JC06 Rec'd PCT/PTO 10 JUN 2005

Semitrailer coupling

The invention relates to a semitrailer coupling comprising a coupling plate and a bearing block for movable fastening of the coupling plate to a frame of a tractor, the bearing block having a bearing region and a fastening region, the bearing region being designed for pivotable bearing of the coupling plate and the fastening region being designed for detachable fastening of the coupling plate to the frame of the tractor.

In motor vehicle traffic, increasing use is made of semitrailer trucks with semitrailer couplings. A tractor has a coupling plate, into which a pin, what is known as the king pin, of the trailer is engaged. In this connection, the trailer lies relatively freely movably on a semitrailer coupling plate of the tractor. The semitrailer coupling plate is connected to the frame of the tractor via two bearing blocks. The bearing blocks comprise bearing elements, which are arranged transversely to the direction of travel of the tractor and make possible pivoting of the coupling plate about a pivoting axis transversely to the direction of travel.

A semitrailer coupling of the generic type is known from WO 01/34454 A1. The bearing blocks, which are in each case fastened on the left and right side of the vehicle frame, are interconnected parallel to the pivoting axis via a cross-strut. The cross-strut can also be designed on the inner side of the vehicle as a projection on the bearing block concerned. The bearing blocks, the projections and/or the cross-struts rest on the horizontal surface of the frame construction of the tractor.

Starting from this prior art, it is an object of the invention to indicate a semitrailer coupling which is constructed from as few individual parts as possible, the weight of which is as low as possible and which is compatible with existing semitrailer coupling plates.

This object is achieved by a semitrailer coupling comprising a coupling plate and a bearing block for movable fastening of the coupling plate to a frame of a tractor, the bearing block having a bearing region and a fastening region, the bearing region being designed for pivotable bearing of the coupling plate and the fastening region being designed for detachable fastening of the coupling plate to the frame of the tractor, and, sectioned in the direction of travel and parallel to the pivoting axis, the bearing region having a larger cross section than the fastening region.

Preferred developments of the invention emerge from the dependent claims.

It is advantageous that the semitrailer coupling can be constructed from as few individual parts as possible. This is achieved by virtue of the fact that the bearing blocks are formed from a one-piece casting.

It is also advantageous that transverse forces which act on the semitrailer coupling can be compensated in the bearing blocks. This is achieved by virtue of the fact that the bearing region of the bearing blocks is designed in such a way on the inner side of the vehicle that a clearance for movements of the coupling plate in a direction transverse to the direction of travel is present between the bearing region and the semitrailer coupling plate.

An illustrative embodiment of the invention is described with reference to the figures, in which:

Figure 1 shows a three-dimensional view of a semitrailer coupling according to the invention;

Figure 2 shows a view of the semitrailer coupling from Figure 1 in the direction of travel, and

Figure 3 shows a section through a bearing block perpendicular to the direction of travel.

A semitrailer coupling 1 is illustrated in three-dimensional form in Figure 1. The semitrailer coupling 1 is arranged on a tractor (not illustrated here) and serves for movable connection of the tractor to a trailer (likewise not illustrated here) of a semitrailer truck combination. When the trailer is coupled to the tractor, what is known as a king pin, which is arranged on the front lower side of the trailer, is located in a coupling claw 2 of the semitrailer coupling 1. Of the tractor, only a part region of a frame 3 is illustrated. The semitrailer coupling 1 comprises essentially a coupling plate 4 and two bearing blocks 5, only one bearing block 5 of which is illustrated here on the left side in the direction of travel x of the tractor.

The bearing block 5 has two regions with different functions: a bearing region 6 and a fastening region 7. Bearing elements, which serve for pivotable mounting of the coupling plate 4 about a pivoting axis y, are located in the bearing region 6. The pivoting axis y extends transversely to the direction of travel x of the tractor. Screws 8, with which the bearing block 5 is fastened to the frame 3 of the tractor, can be seen in the fastening region 7. The bearing block 5 is advantageously fastened to the vertical side surface 9 of the vehicle frame 3 by means of screws 8. Lateral screw fastening makes it possible for mounting and

demounting to be carried out extremely easily on existing vehicle frames as well.

In Figure 2, the semitrailer coupling 1 from Figure 1 is again illustrated, seen in the direction of travel x of the tractor. It can be seen clearly here how the fastening region 7 of the bearing block 5 is fastened to the vertical side surface of the vehicle frame 3 with screws 8. No fastening or support is necessary on the horizontal surface of the vehicle frame 3, which is a surface with extremely poor access in the assembled state of the tractor. The second bearing block 5 on the right side of the coupling plate 4 has been omitted in Figure 2 for greater clarity. The references in Figure 2 refer to the same features as described in Figure 1.

In Figure 3, the bearing block 5 is illustrated on its own in a section perpendicular to the direction of travel x. A receiving region 10, which is provided on the underside of the coupling plate 4 for receiving the bearing block 5, is indicated diagrammatically with broken lines in the bearing region 6. The horizontal side surface 9 of the vehicle frame 3 for fastening the bearing block 5 is indicated with further broken lines in the fastening region 7. The bearing block 5 has a width b in the bearing region 6 which is at least 2.5 times the width of the bearing block 5 in the fastening region 7. The bearing block 5 is manufactured as a one-piece casting.

In the dimensioning of the casting, the shape is calculated in such a way that the necessary rigidity is achieved with minimum weight of the casting. On the inner side of the vehicle, the bearing region 6 is machined in such a way after casting that a clearance S remains free in the assembled state between the bearing region 6 of the bearing block 5 and the receiving region 10 of the semitrailer coupling plate 4. This clearance S left free on one side on the inner side of

the vehicle serves for compensating movements of the coupling plate 4 in the direction of the pivoting axis y. Such a clearance S is likewise provided on the inner side of the vehicle in the case of the opposite bearing block (not shown here).

In the event of deformation in the direction of the pivoting axis y, these clearances S in each case receive the bearing regions 6 of the bearing blocks 5. In this way, transverse forces which in the operating state act on the semitrailer coupling 1 from the outer side of the vehicle to the inner side of the vehicle are compensated.

A cross-strut, previously mounted between the bearing blocks 5 to take up these transverse forces, is no longer required. Mounting and demounting the cross-strut in the region of difficult access below the coupling plate 4 is dispensed with. The bearing blocks 5 can be adapted to existing semitrailer couplings and existing vehicle frames. The present semitrailer coupling 1 with the newly dimensioned bearing blocks 5 makes possible, with the same load-carrying capacity, a reduction in weight and consequently a fuel saving for the semitrailer truck combination.